



INVESTOR IN PEOPLE

Visteon Global Technologies Inc
% Dummett Copp
25 The Square
Martlesham Heath
IPSWICH
IP5 3SL

**The Patent Office
Patents Directorate**

Concept House
Cardiff Road, Newport
South Wales NP10 8QQ

Examiner: 01633 814974
†E-mail: john.cockitt@patent.gov.uk
Switchboard: 01633 814000
Fax: 01633 814444
Minicom: 08459 222250
DX 722540/41 Cleppa Park 3
<http://www.patent.gov.uk>

Your Reference: P3230.P4/PAG
Application No: GB 0203690.3

18 October 2002

Dear Sirs

**Patents Act 1977:
Combined Search and Examination Report under Sections 17 and 18(3)**

Latest date for reply: 18 April 2003

I enclose two copies of my search and examination report and a copy of the citations.

By the above date you should either file amendments to meet the objections in the report or make observations on them. If you do not, the application may be refused. In respect of the foreign language document(s) listed I have enclose an English Language abstract(s) for your convenience.

Scope of the search

The documents listed are examples only of disclosures concerning the principle of increasing phase number to remove ripple which satisfy the $2n+1$, $n > 1$ requirement.

Publication

I estimate that, provided you have met all formal requirements, preparations for publication of your application will be completed soon after **19 November 2002**. You will then receive a letter informing you of completion and telling you the publication number and date of publication.

Amendment/withdrawal

[†]**Use of E-mail:** Please note that e-mail should be used for correspondence only.



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If you wish to file amended claims for inclusion with the published application, or to withdraw the application to prevent publication, you must do so before the preparations for publication are completed. **No reminder will be issued.** If you write to the Office less than 3 weeks before the above completion date, please mark your letter prominently: "**URGENT - PUBLICATION IMMINENT**".

Yours faithfully

John Cockitt
Examiner

Important information about combined search and examination

I also ask that you take note of the following points. These might have a bearing on the future stages of your application because the examination report has been sent to you before your application has been published.

- (a) You may file voluntary amendments before making a full response to my examination report. We will publish with your application any new or amended claims you file voluntarily or as a full response, provided that they are received before preparations for publication are completed. It would help us when you file amendments before publication if you could **prominently indicate** in a covering letter whether or not the amendments are intended as a full response to the examination report.
- (b) If you file a full response to the examination report before your application is published I will consider it as soon as possible. However, if this would disrupt the publication of your application, I would have to delay taking any action until the application had been published. This delay could be up to 3 months, depending upon when we receive your response.
- (c) There is another situation when there might be a delay between you filing a full response and the Patent Office responding to it. This would arise if you met all my objections but your application had not or had only recently been published. I could not report the outcome of my re-examination until I was satisfied that the search was complete for documents published before the priority date of your invention and that anybody interested in the application has had three months following publication of the application to make observations on the patentability of your invention.
- (d) Provided that the requirements of the Act have been met, I can send your application to grant as early as three months after publication. Before doing so I will bring the original search up to date and raise with you any further objection that might result from this top-up search. However, there is a possibility that at that time I may not have access to all the patent applications published after the priority date of your invention and of possible relevance to your application. If this is the case I would have to complete the search after grant and if necessary raise any new found novelty objection then.



Application No: GB 0203690.3
Claims searched: 1-22

Examiner: John Cockitt
Date of search: 18 October 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T):

Int Cl (Ed.7):

Other: ONLINE: EPODOC, WPI, JAPIO; OPTICS:H2A

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	US4161680A	MITSUBISHI - 5 or 7 phase rotary machine	1 at least
X	US3784894A	ROTAX - 5 phase alternator	1,11,19 at least
X	SU000991556A	NI EX I AVTOMOBIL - 5 phase generator	1,11,19 at least
X	SU000924798A	NI EX I AVTOMOBIL - 7 phase generator	1,11,19 at least
X	JP540099910A	GOTOU - see (2m+1) phase relationship	1 at least
A	GB2272294A	NIPPON - example of ripple reduction by double winding sets.	

- | | | | |
|---|---|---|--|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
| & | Member of the same patent family | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |



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Novelty/ inventive step

1. In the light of the documents listed below it would appear that the invention as defined in independent claims 1,11,19 and their associated dependent claims is not new or does not set out an inventive step because it has already been disclosed in said documents or would be obvious to the skilled man in the light of common engineering practice in respect of dynamo electric machines and the known art:

US4161680A	MITSUBISHI
US3784894A	ROTAX
SU000991556A	NI EX I AVTOMOBIL
SU000924798A	NI EX I AVTOMOBIL
JP540099910A	GOTOU

2. As can be seen from the above, the problem of ripple and torque fluctuations is well known in motors and generators and increasing the number of phases as a solution has been identified, the documents listed above being example of a number of documents which propose the solution. It would appear that the skilled man being aware of the solution would not perform an inventive step in produce the required rectifying or switching circuitry by merely extending that use in three phase systems by duplicating the appropriate number of elements for each additional phase. Similarly the use of equivalent winding layouts to the three phase delta or star arrangements (polygon/common mode) would be an selection by the skilled man based on well known operational criterial.

3. It would appear that the claims will need to be revised so that the intended inventive concept over the prior art, when considered in the light of general knowledge, is clearly established. It is possible that a further search may be necessary.

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